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REVIEW OF PROGRESS IN SHORT-TERM FORECASTING AND MULTI-SECTORAL PLANNING MODELS

Introduction

1. In accordance with ECA resolution 500 (XIX) on short-term forecasting in the African region, ECA Secretariat continued to assist African countries in the implementation of these systems. It will be recalled that this work was started in 1982 where initial contacts were made to start the process of installing forecasting systems based on the Social Accounting Matrices. During the period under review, the work was followed up and the system implemented in some of the countries. Further contacts were also made with other countries with a view to finding out their interest in establishing SAM-based forecasting systems.

2. In general the work proved to interest many countries which believed that the tool would be useful for identifying short-term bottlenecks and generating possible solutions. In some countries, the work was undertaken with the assistance of the World Bank. In other countries, however, problems of resources to undertake the preliminary surveys for data constrained the commencement of the forecasting system. Further, the period under review was characterised by a very serious crisis in many African countries thus detracting much of the attention away from planning to survival emergency programmes.

3. The present paper gives an overview of the experience that the secretariat gained in the implementation of the system in some countries. Specific issues and proposals are derived from this experience for the benefit of the countries that might, in the future, wish to establish the forecasting system. Part two of the paper also gives an analysis of a complementary project dealing with multisectoral planning models. This is found to be particularly important in view of Africa's Priority Programme for Economic Recovery adopted by the 21st session of the OAU. The implementation of this programme will, no doubt, require a thorough understanding of the sectoral linkages in the individual African countries. Planners would, therefore, have to translate the programmes' priorities into national consistent sectoral programmes focussing on agriculture.

PART I - SHORT-TERM FORECASTING IN AFRICA: OVERVIEW OF PROGRESS

4. Subsequent to the initial ECA/ADB efforts to implement the SAM-based model in Zimbabwe, Cameroon, Zaire, Rwanda, Mauritius, Egypt, Sudan and Ivory Coast, the work was advanced further during the period under review in Mauritius and Rwanda. Models for these countries were formulated and tested first at the ECA secretariat and then missions were mounted to install them in the countries themselves. This work enabled the secretariat to have clear insights into the implementability of these models. The problems encountered both at the secretariat in the model formulation and testing and in the country during the installation of the models are outlined below.

Requirements for model operationality

5. The exercise of building an elaborate national model requires certain basic elements at the national level. While many countries have shown tremendous interest in the SAM-based models, the absence of some of these elements proved to be a major constraint in ensuring the possibility of even initiating the model exercise. Of the basic major prerequisites for establishing a SAM-based short-term forecasting model the following are critical:

(a) Basic data especially as regards an input-output table, and appropriate disaggregation of other variables such as value added by factor input, exports by sector and by markets of destination, financial data etc.

(b) Computer facilities including appropriate software for different compuer languages, regression analysis and other data manipulation packages.

(c) Core of staff trained in computer programming or operations, econometric analysis etc.

1.1 Data requirements

6. The requirements of data that a highly disaggregated Social Accounting Matrix requires can, sometimes, be enormous. This is because the SAM often necessitates highly disaggregated data that often may not be readily available. Further, not all African countries have an input-output table which is the nucleus of the SAM-based models. As such, some countries found tremendous difficulties in collecting the necessary data. In some countries, the implementation of the forecasting model actually was only possible because the country undertook a complete survey of the economy to establish an input-output table. In other countries, the ECA secretariat had to establish an input-output table from previous surveys before the model could be implemented.

7. The degree of disaggregation of the basic national accounts variables is also a major requirement for the efficiency of a SAM-based forecasting- system. Variables like investments have to be disaggregated into government and public investments and then further into the different sectors. Similarly consumption has to be disaggregated both at the sectoral and institutional levels. Value added in each sector has to be split into the various factors as returns to capital, wages, rent etc. All this disaggregation constitutes a major burden for the statistical services of the countries. In the face of this major constraint the ECA secretariat has often made changes in the model of the country concerned to make it less demanding statistically. The major elements of these modifications are:

(a) reduction in the number of sectors covered: it is felt that ten sectors would usually be sufficient in showing the path of short-term developments;

(b) limitations of the level of disaggregation: for institutions it is usually possible to limit it to government and private institutions while for factors of production capital and labour are often sufficient;

(c) complementing the data available with independent estimates from a brief research aiming at establishing certain proportions (e.g. for dividends, inter-institutional transfers etc.).

8. Admittedly, the modifications and approximations that are made reduce both the coverage, reliability and operational efficiency of the model. It, therefore, must be emphasised that it is clear from the secretariat's experience in implementing the SAM-based models that there is urgent need to improve the statistics in African countries. Indeed it should be stressed that one of the most important aspect of embarking on a SAM in a country is the possibility of identifying the data gaps that the statistical services must fill for the plan to be able to clearly map the history and future of the economy.

1.2 Computer implementation of models

9. The running of any model requires the facilities of a computer. Most of the African countries do have a computer in the country in ministries or other organisations. However, the experience of ECA in installing models at the country level has shown that it is absolutely necessary to have a computer in the ministry in which the model is to be run. This is because the running of alternative scenarios and data up dates require the constant availability of a computer. Fortunately the new generation of small personal computers should make it possible for the relevant ministry or department to acquire, at low costs, a computer. However two problems must be stressed in this regard. Firstly, the computer on which a model is to be run should have adequate minimum core capacity in the range of 128K - 248K. This is because the storage of model data and alternative scenario formulations require relatively large storage space. This requirements should not be difficult to fulfil as there are many micro computers with high core capacity. Indeed ECA has been able to install a SAM-based model on a micro-computer in one of the African countries. The other requirement is that of the computer language. As of now, the ECA installs the forecasting models in the FORTRAN language. Country computers should therefore possess a "Fortran" compiler.

10. Another aspect that has emerged in the installation of forecasting models has been the easy-of-operation of the model programme. It is desirable that the computer operations needed to make a run should be as simple as possible. Essentially the model should be "packaged" so that it can be interactively run in "conversation" mode. The ECA secretariat is still studying this problem in order to come up with an easy user-friendly package.

1.3 Manpower requirements

11. For the successful implementation of forecasting models at the country level it is essential for the country to have the requisite staff. In the countries where the models have been installed, it has been found necessary to train this core staff in (i) operating the computer (ii) basics of programming (iii) updating and changing the model to suit the evolving economic situations. The problem so far identified in the countries relates mainly to the shortage of resources for external training of staff.

1.4 Model structures and their improvement

12. As noted earlier, the data problems often determine the extent and structure of the model in terms of the variables that can be forecast and/or those that can be used as explanatory variables in the model equations. But even when data is available, experiences with the installed model has shown one major weakness. This relates to the fact that presently the SAM-based models are in physical terms i.e. they deal mainly with variables at constant prices. The integration of domestic prices and financial variables such as devaluation, inflation has not yet been attempted in the models. The secretariat plans to embark on this question and come up with a model that includes these variables which do influence the short-term direction of the African economies. Besides this unique problem, experience has shown that the models differ from country to country depending on the structure of the economy and the type of policy questions that the country wishes to analyse.

1.5 Issues and dissemination and model application

13. The model is not an end in itself. The utility of the model lies in the insight it can give to planners regarding alternative policy options. From this point of view it is vitally important that countries that establish the various types of models establish a system of disseminating the results of the model and thereby ensure the maximum application of policy choices in decision making. From the experience of ECA three aspects have been identified as being very useful in ensuring that model results become inputs in the decision process at the country level. These aspects relate to (i) Inter-ministerial Task Force, (ii) Seminars and (iii) frequent pulbication and updating of results.

14. The establishment of an Inter-ministerial Task Force would ensure that the model is widely discussed and known in the various ministries. In this way the inputs into the model would have a large and reliable base while the results would be able to reach a wide spectrum of those involved in taking economic decisions. Thus while the particular ministry that runs the model would have its own core staff of forecasters this should be linked to other ministries to benefit from cross-fertilisation of ideas.

15. Seminars which have been tried in one of the countries in which the model has been installed by ECA have also shown to be very useful in disseminating the results of models and generating interest in the questions of economic management. Here two ytpes of seminars must be distinguished. First there are national seminars where the participation is at the national level. The second type is the international seminar where the model and its results are brought to the attention of the international community such as donors, neighbouring countries, agencies of the United Nations system etc. Each type of seminar has its specific advantages and the country should decide on which of the two types it needs most. It must nevertheless be stressed that the frequency of the national seminars must be kept high at say twice a year as to maintain the momentum. International seminars on the other hand can be undertaken less frequently.

Concluding remarks

16. The ECA secretariat has always underscored the importance of economic management and planning. This emphasis must be reiterated especially in view of Africa's Priority Programme 1986-1990 which will, inter alia, require the formulation of specific programmes at the national level. Thus the ECA secretariat stands ready to assist the countries in establishing short-term forecasting models to help them devise and decide on policy options in the short-term.

PART II. WORKSHOP ON MULTI-SECTORAL PLANNING MODELS

2.1 Background

17. For the last five years or so, the ECA secretariat has been heavily engaged in a series of programmes in building planning models with the objective of helping the African countries in the formulation of economic strategies and policies within a coherent and consistent national development framework. Besides the work in planning techniques and methodologies suitable for Africa's pressing problems, the ECA programme of work also aims at building the appropriate capabilities in modelling at the country level. At present, the modelling work has been extended to encompass short-term forecasting and outlook models based on social accounting matrices as discussed in Part I.

18. In 1980, the ECA completed a series of macro-economic projection models which were used to generate policy options for Africa in both the International Development Strategy for the 1980s and the Lagos Plan of Action. The studies relating to these models were submitted to the first session of the Joint Conference of African Planners Statisticians and Demographers in March 1980, who made various recommendations such as the extension of the models to cover multi-sectoral analysis and also to supplement the macro- and long-term models by short-term forecasting models.

19. Pursuant to the recommendations of the First Session of the Joint Conference, a study on sectoral output and employment projections was undertaken and submitted to the Second Session of the Joint Conference of African Planners, Statisticians and Demographers in March 1982. The study on sectoral output and employment projections was carried out using various methodological approaches to take account of the peculiarities of the different economic systems in Africa.

20. Subseqeunt to these studies the Second and Third Sessions of the Joint Conference pointed to the need to improve on multi-sectoral models, especially as regards (i) the introduction of changes in technical coefficients over time, (ii) the incorporation of the informal sector in planning and (iii) the inclusion of financial variables relating to prices, balance of payments, money and finance. The Second and Third sessions of the Joint Conference of African Planners, Statisticians and Demographers recommended the convening of a workshop on multi-sectoral planning models for African planning experts to examine the work in the above areas. The objectives and planned activities of the workshop are given below.

2.2 Objectives of the workshop

21. The objective of the workshop on multi-sectoral models is to improve planning machinery and building the appropriate capabilities in modelling exercises at the country level in order to help the African countries in the formulation of

economic strategies and policies. As recommended by the Second and Third Sessions of the Joint Conference, the experts would discuss a number of topics and make concrete proposals regarding the implementation of the models at the country level.

2.3 The main topics to be covered during the workshop

(a) The integration of the informal sector in multi-sectoral development planning

22. Under this topic, an attempt would be made to understand: (a) the emergence of the informal sector in developing African countries; (b) the interlinkages between the formal and informal sector, and (c) the interrelationships between the growth of the formal sector and the informal activities.

(b) The dynamization of input-output technical coefficients: experiements in long-term projections of economic growth in developing African countries

23. The areas to be covered under this item relate mainly to input-output techniques. The methodologies of dynamising the input-output coefficients would be reviewed. Illustrations will be given on how to update input-output table using various methods. This is particularly important in view of the shortage of resources that are available to construct new tables that reflect changes in relative price and in technology. The workshop will also examine the importance of dynamic input-output table techniques in dealing with problems of changes in the capital structure and reosurce allocation.

(c) The treatment of price and balance-of-payments variables in short-term SAM based forecasting models

24. The workshop will examine the problem of introducing prices in the input output part of the SAM. The introduction of the major external variables (like world commodity market situation, balance of payments, availability of official flows, debt service burden etc.) will also be examined in order to assess the impact of these variables on the overall forecasting system.

(d) Elaborate modelling of the energy sector for improved energy balance in Africa methodological framework

25. The workshop will examine new approaches in modelling the use of fuel wood on deforestation in African countries. The approach based on reference energy systems will be discussed along with the patterns of energy consumption for households and producing sectors. Scenarios reflecting different patterns of energy use and demand and projections up to the year 2000 will be discussed.

2.4 Inputs into the workshop

(a) Inputs expected from country experts

26. In view of the technical nature of the topics, the workshop will be attended by national experts in the fields outlined above. In order to have a wide coverage of national experiences, twenty countries or research institutions will be expected to participate. Each expert will be expected to provide a short paper on the national experience in the use of methodologies relating to multi-sectoral planning models.

(b) Inputs expected from other UN organisations

27. Other United Nations Agencies - namely the Department of International Economic and Social Affairs (DIESA), UNCTAD, UNIDO and ILO have in the past few years prepared world economic outlooks and perspective studies, including those of the African region. The inputs of these specialized agencies and bodies of the UN system will be of crucial importance. These UN agencies will be expected to provide information to participants on the techniques they use for forecasting and perspective studies:

- UNCTAD will be expected to present a paper on item (c) outlining its experience on price and balance-of-payments variables in developing Africa;
- UNIDO will give its experience in using input-output techniques in development planning;
- ILO will deal with modelling of the informal sectors;
- DIESA will give a review of models used in the global perspective studies.

2.5 Financing the workshop

28. The project is expected to be financed under the USSR/UNDP Trust Fund. The financing will ocver a limited number of national participants and lecturers, along with other UN participants. USSR will act as host for the seminar and will contribute towards the administrative and organizational costs.

2.6 Organization of the workshop

29. Participating governments will be expected to nominate one senior official in the field of socio-economic development planning to attend the seminar. Basic planning and model building knowledge will be required of each participant who is also expected to enrich the seminar with the experience of his/her country in these fields. A total of 20 participants will be accepted for the seminar. Interested officials should fill in the questionnaire annexed to this report and submit it to the secretariat.

ANNEX

Questionnaire for Participants in Workshop on Multi sectoral Planning Models: Moscow, USSR, Third Quarter 1986

1. Name _____

   Functional Title _____

   Office or Department _____

   _____

   Ministry _____

   _____

   Country _____

2. Subjects of Interest _____

   _____

   Indicate whether you can prepare a country paper on the following topics:

   1. The integration of the informal sector in multi-sectoral development planning;

   2. The dynamisation of input-output technical coefficients: Experiments in long-term projections of economic growth in developing African countries;

   3. The treatment of price and balance-of-payments variables in short-term SAM based forecasting systems;

   4. Ellaborate modelling of the energy sector for improved energy balance in Africa: a methodological framework.

   Indicate approximately date of submission of the paper (all papers must be submitted before June 1986 and should not exceed 10 pages).